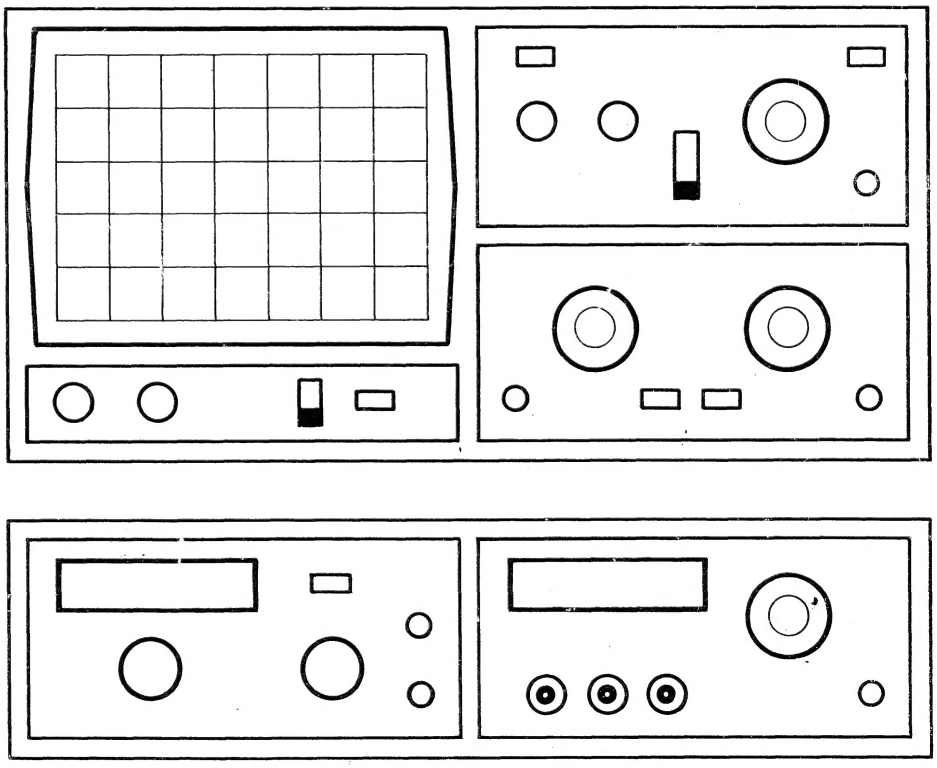
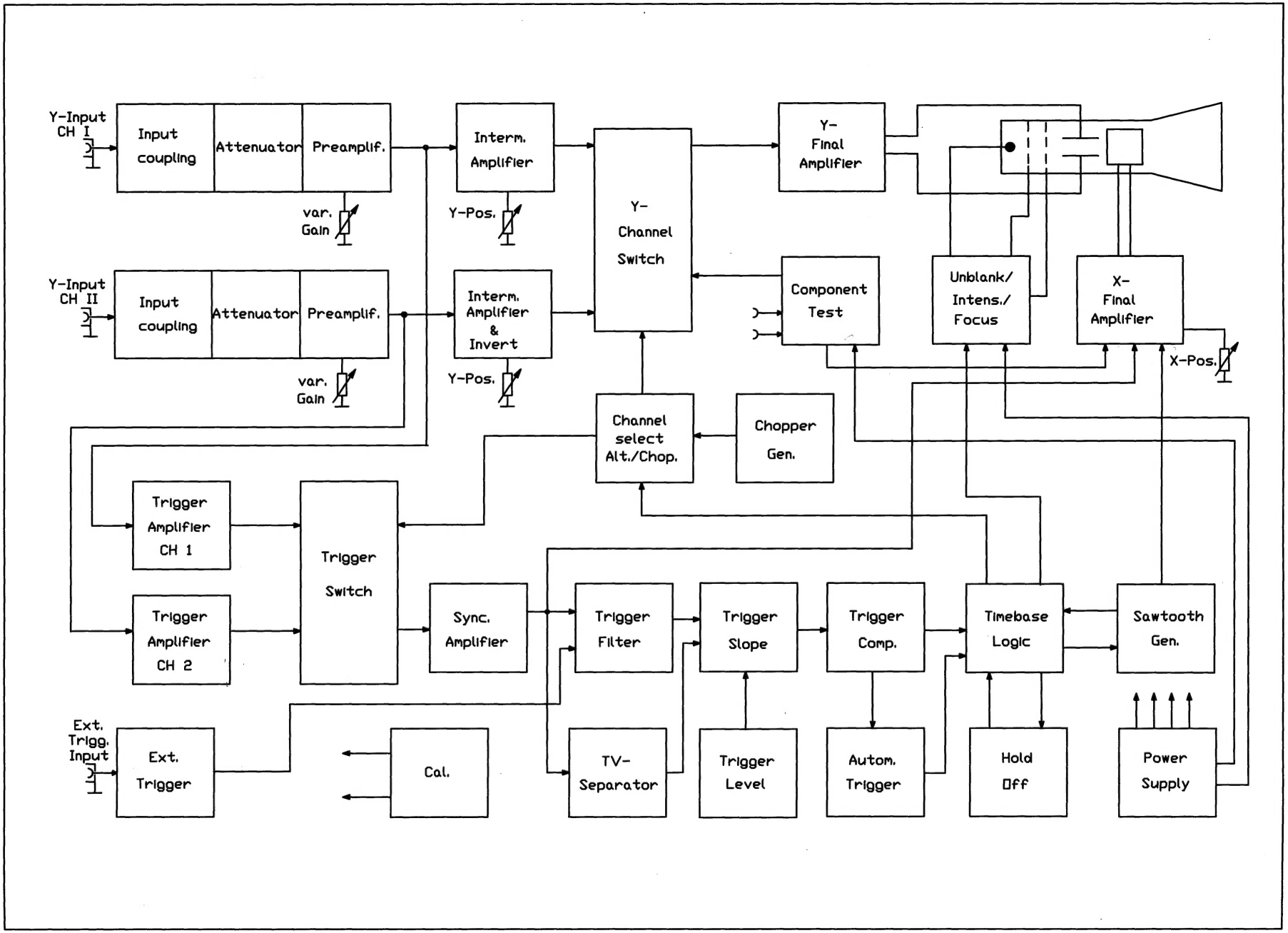
HAMEG
Instruments

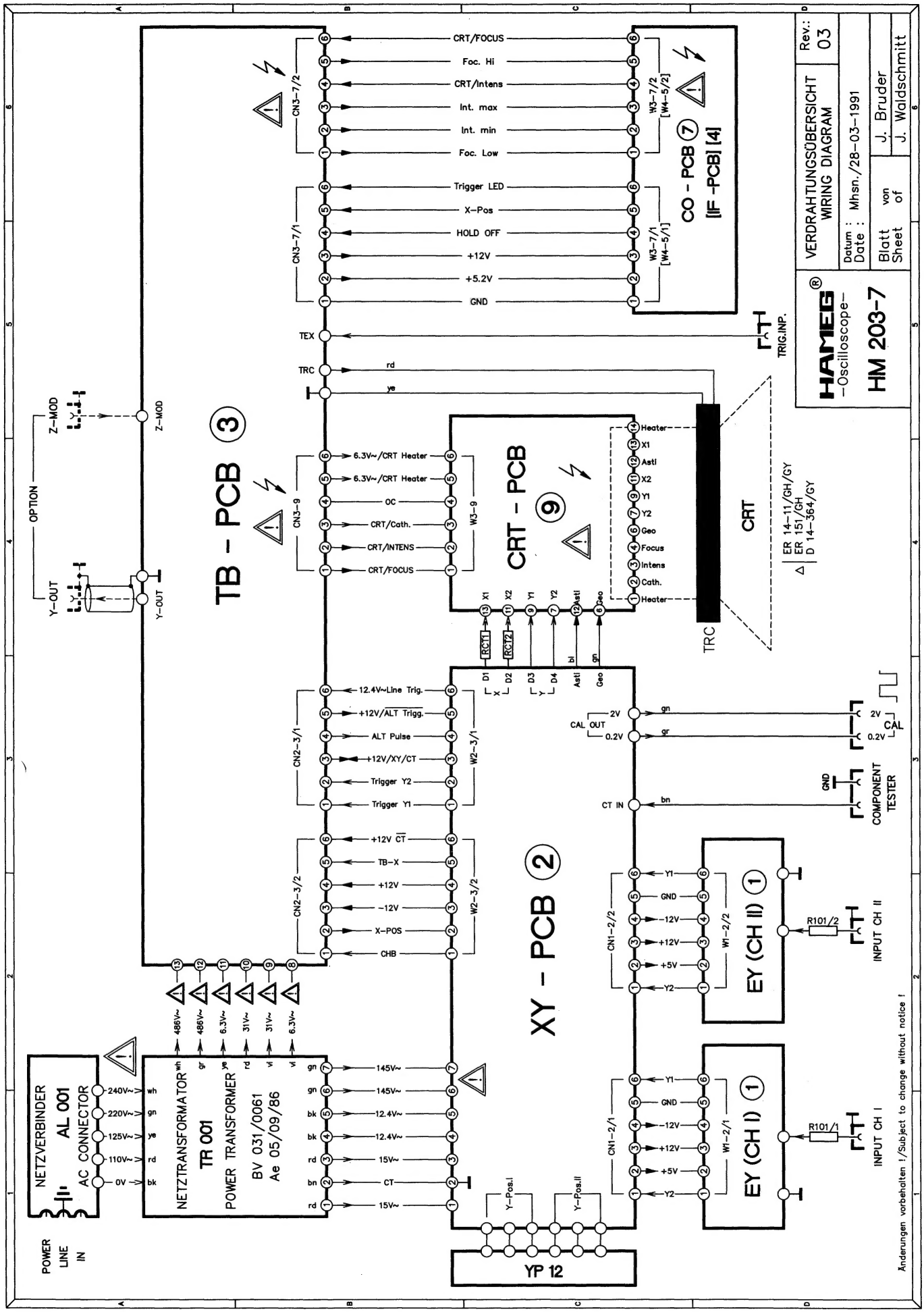
MANUAL

Oscilloscope
HM203-7





Änderungen vorbehalten / Subject to change without notice


HAMEG
-Oscilloscope-
HM 203-7
VERDRAHTUNGSÜBERSICHT
WIRING DIAGRAM
Rev.: 03
Datum : Mhsn./28-03-1991
Blatt von
Sheet of
J. Bruder
J. Waldschmitt
TB - PCB 3
CRT - PCB 9
XY - PCB 2
CO - PCB 7
[IF -PCB] [4]
CRT/FOCUS
Foc. Hi
CRT/Intens
Int. max
Int. min
Foc. Low
Trigger LED
X-Pos
HOLD OFF
+12V
+5.2V
GND
TEX
TRC
TRIG.INP.
6.3V~/CRT Heater
OC
CRT/Cath.
CRT/INTENS
CRT/FOCUS
Heater
X1
Astl
X2
Y1
Y2
Geo
Focus
Intens
Cath.
CRT
ER 14-11/GH/GY
ER 151/GH
D 14-364/GY
OPTION
Z-MOD
Y-OUT
12.4V~Line Trig.
+12V/ALT Trigg.
ALT Pulse
+12V/XY/CT
Trigger Y2
Trigger Y1
+12V CT
TB-X
-12V
X-POS
CHB
CAL OUT
2V
0.2V
CAL
GND
COMPONENT TESTER
CT IN
EY (CH II) 1
EY (CH I) 1
R101/2
R101/1
INPUT CH II
INPUT CH I
Y-Pos.I
Y-Pos.II
YP 12
NETZVERBINDER
AL 001
AC CONNECTOR
240V~
220V~
125V~
110V~
0V
POWER LINE IN
NETZTRANSFORMATOR
TR 001
POWER TRANSFORMER
BV 031/0061
Ae 05/09/86
486V~
6.3V~
31V~
145V~
12.4V~
15V~
CT
Änderungen vorbehalten ! /Subject to change without notice !

Bezeichnung der Bauteile

HM203-7

Identification of electrical Components

Die elektrischen Bauteile sind so gekennzeichnet, daß die erste Nummer mit der Baugruppen-Nummer übereinstimmt:

Chassis 0..
Y-Eingang, ext. Triggereingang,
Gerätestecker, Netzschalter, Netztransformator usw.

EY-Board I+II 1..
Eingangsteiler, Y-Vorverstärker (Kanal I + II), GD-AC/DC Schalter

X/Y-Board 2..
Y-Zwischenverstärker, Kanalumschaltungs-Flip-Flop,
Dioden-Schaltlogik, Chopper-Generator, Triggerverstärker,
Niederspannungsversorgung, Testleiste, X-Endverstärker,
Y-Endverstärker, Component-Tester

TB-Board 3..
Triggerschaltung, Zeitbasis, Hold-off Schaltung, Helltastung,
TV-Sync.-Sep., Potentiometer für Strahldrehung,
Hochvolt-Stromversorgung, Testleiste

CO-Board 7..
Potentiometer für horizontale Strahllage, Power LED,
Potentiometer für Hold-off, Potentiometer für Helligkeit und Fokus

CRT-Board 9..
CRT-Fassung

Electrical components on certain parts of the HM203-7 are marked such that the first numeral is on:

Chassis 0..
Y-inputs, Trig.-ext. input, Appliance inlet,
Power switch, Power transformer

EY-Board I+II 1..
Attenuator and Preamplifier (Channel I + II), GD-AC/DC switches

X/Y-Board 2..
Y Intermediate amplifiers, Channel selection flip-flop,
Y-Gate driver stages, Chopper generator, Trig. and ext. Trigger
amplifier, Trig. gate driver stages, LV-Power, Check point strip,
Component tester, X-Final amplifier, Y-Final amplifier

TB-Board 3..
Trigger circuit, Timebase circuit, Unblanking circuit,
Hold-off circuit, TV sync. separator, Trace rotation pot.,
High voltage power supply, check strip

CO-Board 7..
X-pos. pot., Power LED, Hold-off potentiometer,
Intensity- and Focus potentiometer

CRT-Board 9..
CRT socket

Farbkennzeichnung der Anschlußdrähte / Color-Abbreviations for insulated wire

bk	= schwarz	/ black	ye	= gelb	/ yellow	gr	= grau	/ grey
bn	= braun	/ brown	gn	= grün	/ green	wh	= weiß	/ white
rd	= rot	/ red	bl	= blau	/ blue	trp	= transparent	/ transparent
or	= orange	/ orange	vi	= violett	/ violet	gn/ye	= grün-gelb	/ green-yellow stripe

Anschlußfolge der Transistoren / **Terminals of Transistors**	BC550C BC560C BF414 BF506	BF199 BF311 BF440 BF959	BF422 BF423	MPS918 MPS3640	BF256B-1	BSX19 (TO18) 2N3866 (TO39) 2N2369A (TO18)	U440	BF458 BF472 BD237 BUX86 MJE340	L200C TDA200 1=Input 2=Limiting 3=GND 4=Refer. 5=Output	FST627	BFS20 Code NA BFS17(AR) Code E5 BF596 Code LH
Ansicht von unten / **Bottom view**											SMD!
Ansicht von oben / **Top view**											

Abkürzungen u. Symbole / Abbreviations and Symbols

AI...	Gerätestecker	/	Appliance inlet
C...	Kondensator	/	Capacitor
TS...	Testpunkt (Testleiste)	/	Check point (check strip)
CN...	Steckverbinder	/	Connector
D...	Brückengleichrichter	/	Bridge rectifier
D...	Diode	/	Diode
D...	Leuchtdiode	/	Light emitting diode
F...	Sicherung	/	Fuse
IC...	Integr. Schaltung	/	Integrated circuit
L...	Spule, Drossel	/	Inductor, Coil
P...	Stecker	/	Plug
SP...	Lötöse	/	Eyelet
R...	Widerstand	/	Resistor
S...	Schalter	/	Switch
T...	Transistor	/	Transistor
TR...	Transformator	/	Transformer
VC...	Trimmkondensator	/	Variable capacitor
W...	Draht	/	Wire
D...	Zenerdiode	/	Z-Diode

△...	Modellabhängig	/	Depends on model
*	Bauteil / Wert abhängig vom CRT-Typ	/	Component / value depends on CRT type
	Bauteil bei Bedarf	/	Component when required
	Kühlkörper/Thermokopplung	/	Heat sink/thermal coupling

... **Achtung - Hinweise d. Handbuchs berücksichtigen**
Attention - Refer to manual

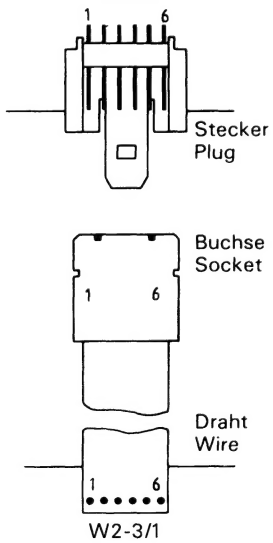
... **Gefahr - Hochspannung / Danger - High voltage**

... **Schutzleiter - Erdanschluß**
Protective ground (earth) terminal

Testleisten / Check strips

XY-Board			TB-Board		
10	▪	NC	10	▪	cath.
9	▪	+152V	9	▪	NC
8	▪	NC	8	▪	−1900V
7	▪	GND	7	▪	NC
6	▪	NC	6	▪	NC
5	▪	+12V	5	▪	NC
4	▪	NC	4	▪	GND
3	▪	+5V	3	▪	NC
2	▪	NC	2	▪	ST/W
1	▪	−12V	1	▪	NC

TB-Board 3..



X/Y-Board 2..

Beispiel Kabelverbindung: P2-3/1-⑤ bzw. W2-3/1-⑤

P = Flachkabelstecker (auf Board ..)
W = Flachkabelverbindung: eine Seite verlötet, andere Seite Buchsenleiste
2-3 = Verbindung zwischen Board 2 und Board 3
1 = 1. Flachkabelverbindung zwischen Board 2 und 3
⑤ = Draht-Nummer des Flachkabels

Example, cable connection: P2-3/1-⑤ or W2-3/1-⑤ respectively

P = Flat cable plug (soldered on board..)
W = Flat cable wiring (direct soldered on board) with socket (movable)
2-3 = Connection between Board 2 and Board 3
1 = First flat cable connection between Board 2 and 3
⑤ = Serial number of the wire (in the flat cable)

Widerstand- / Resistor identification

Widerstand / Resistor: 0.6 W, 1 (2)%, $T_c = 50 \cdot 10^{-6}$/K, metal film
Widerstand / Resistor: 0.25W, 0.5%, $T_c = 50 \cdot 10^{-6}$/K, metal film
Hochvolt Widerstand / High voltage resistor: 1.6kV–, metal film
Hochvolt Widerstand / High voltage resistor: 3.5kV–, metal film

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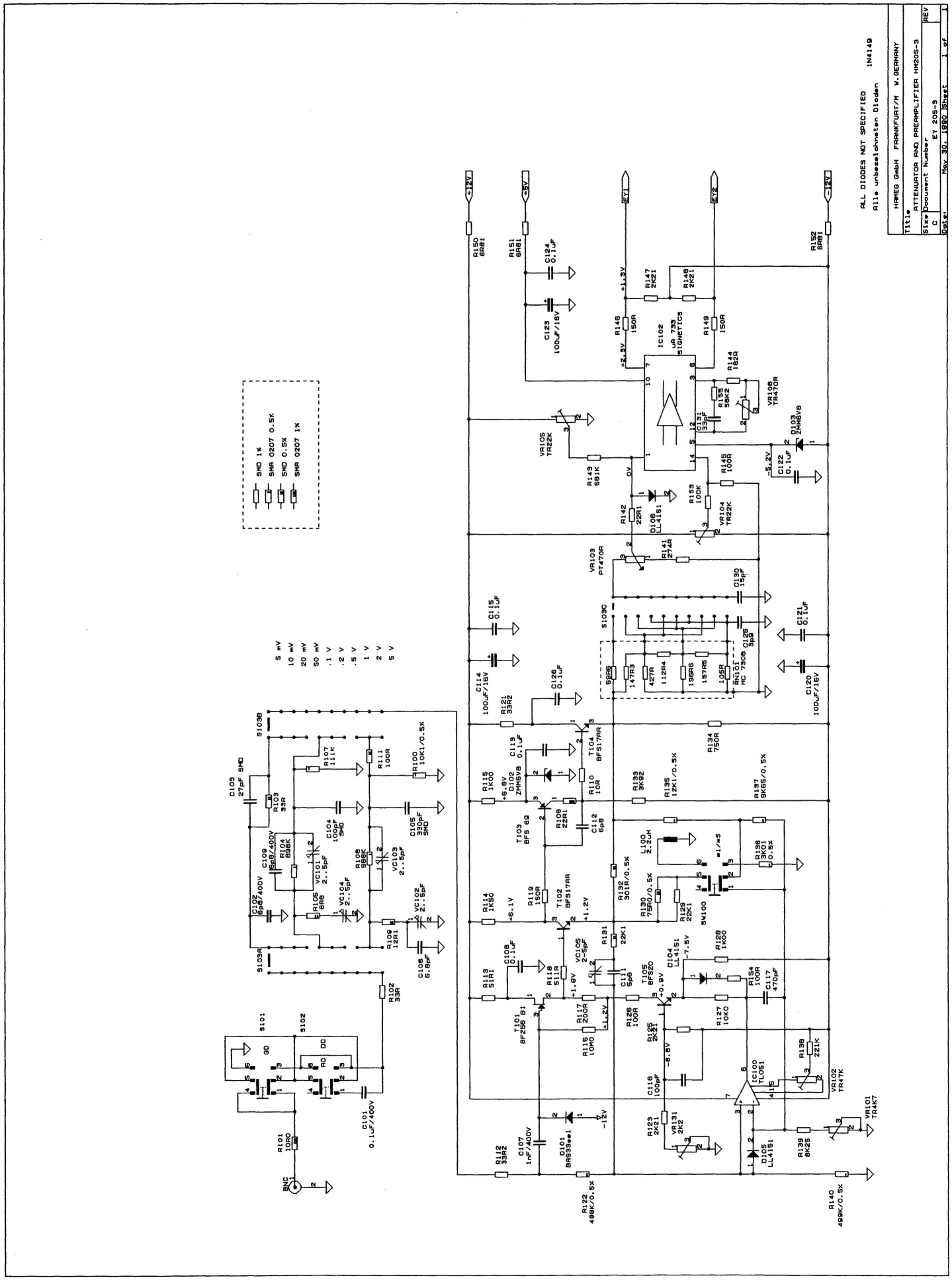
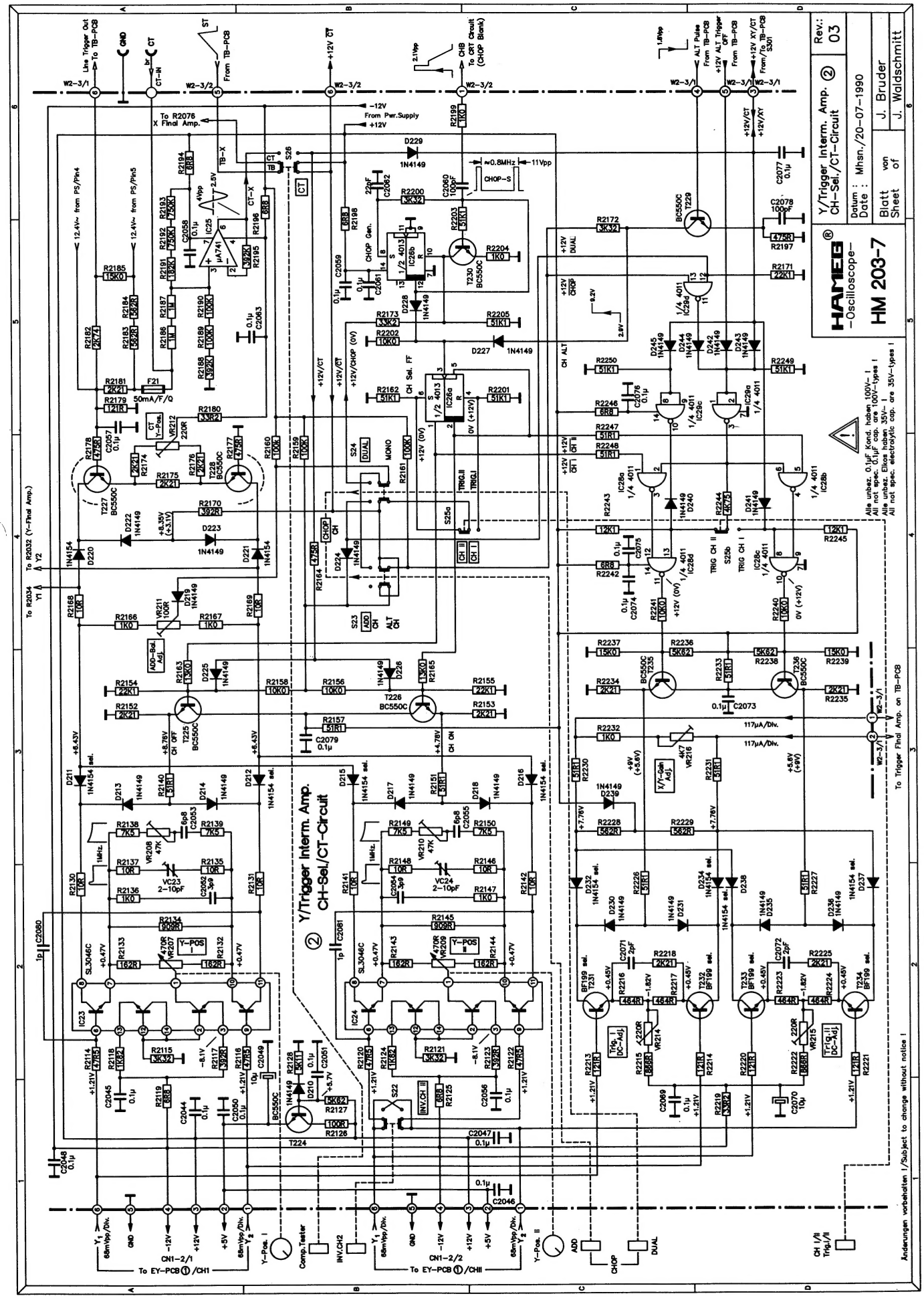

ALL DIODES NOT SPECIFIED
Alle unbezeichneten Dioden
1N4149
HAMEG GmbH FRANKFURT/M W.GERMANY
Title
ATTENUATOR AND PREAMPLIFIER HM205-3
Size
C
Document Number
EY 205-3
REV
Date: May 30, 1990 Sheet 1 of 1
SMD 1%
SMR 0207 0.5%
SMD 0.5%
SMR 0207 1%
5 mV
10 mV
20 mV
50 mV
.1 V
.2 V
.5 V
1 V
2 V
5 V
IC102
uA 733
SIGNETICS
IC100
TL051
S101
S102
S103A
S103B
S103C
BNC
+12V
+5V
EY1
EY2
-12V



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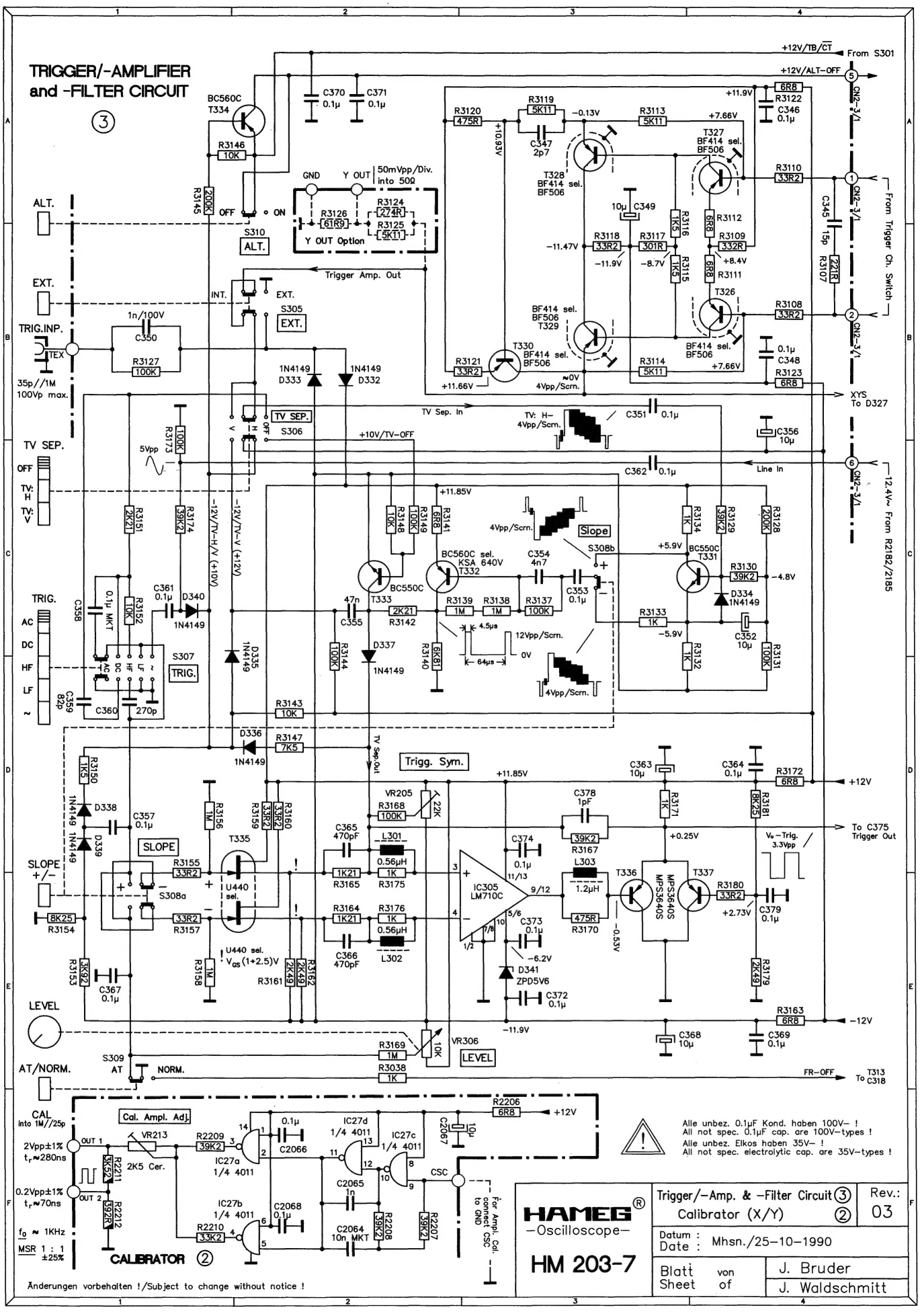
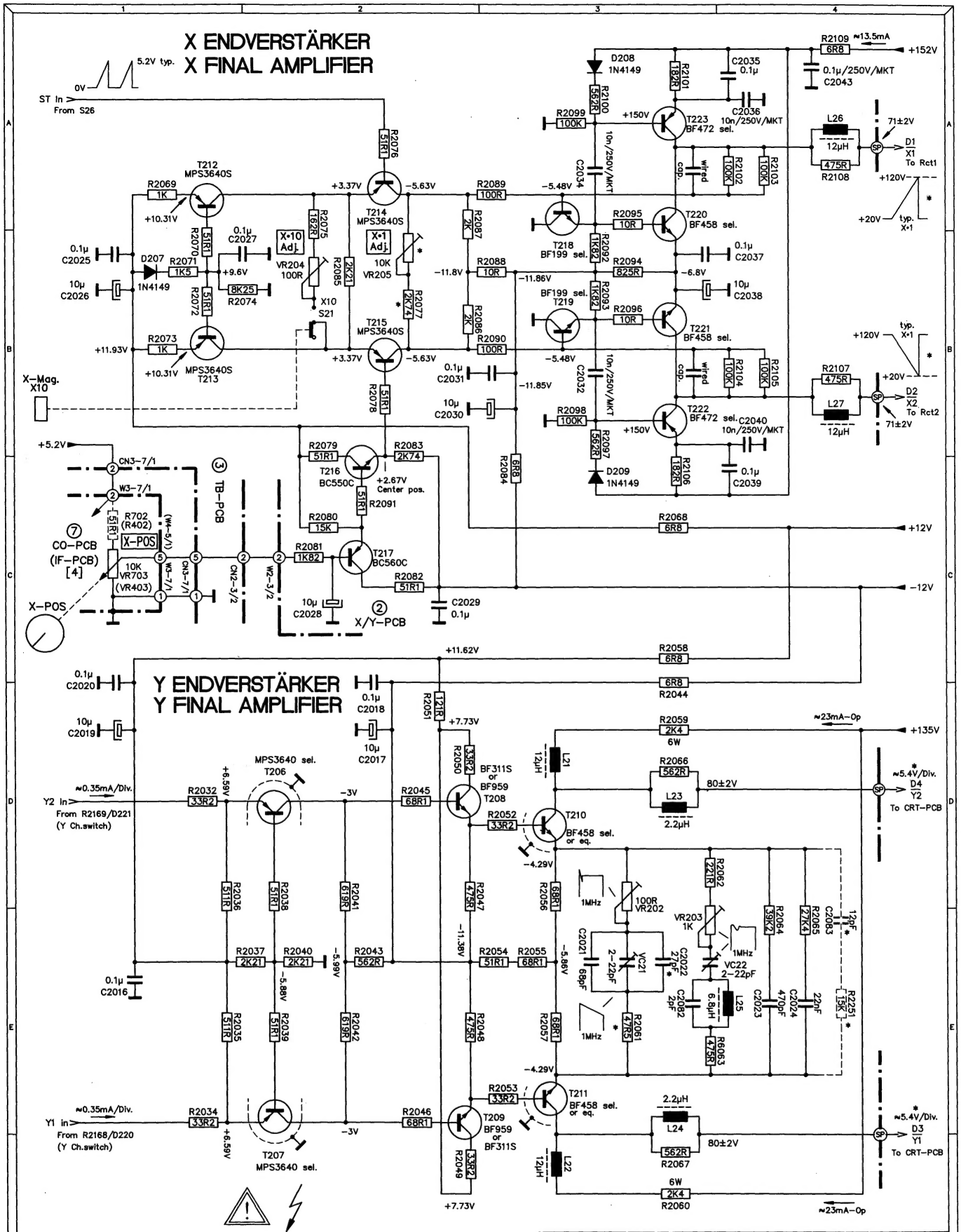

TRIGGER/-AMPLIFIER
and -FILTER CIRCUIT
③
+12V/TB/CT
From S301
+12V/ALT-OFF
CN2-3/1
From Trigger Ch. Switch
12.4V~ From R2182/2185
XYS
To D327
Line In
TV Sep. In
+10V/TV-OFF
Trigger Amp. Out
Y OUT Option
50mVpp/Div.
into 50Ω
ALT.
EXT.
TRIG.INP.
35p//1M
100Vp max.
TV SEP.
TRIG.
SLOPE
+/-
LEVEL
AT/NORM.
CAL
into 1M//25p
2Vpp±1%
0.2Vpp±1%
CALIBRATOR ②
Cal. Ampl. Adj.
2K5 Cer.
For Ampl. Cal. connect CSC to GND
Trigg. Sym.
Slope
To C375
Trigger Out
To T313
C318
FR-OFF
Alle unbez. 0.1µF Kond. haben 100V- !
All not spec. 0.1µF cap. are 100V-types !
Alle unbez. Elkos haben 35V- !
All not spec. electrolytic cap. are 35V-types !
HAMEG®
-Oscilloscope-
HM 203-7
Trigger/-Amp. & -Filter Circuit ③
Calibrator (X/Y) ②
Rev.: 03
Datum : Mhsn./25-10-1990
Date :
Blatt von
Sheet of
J. Bruder
J. Waldschmitt
Änderungen vorbehalten !/Subject to change without notice !



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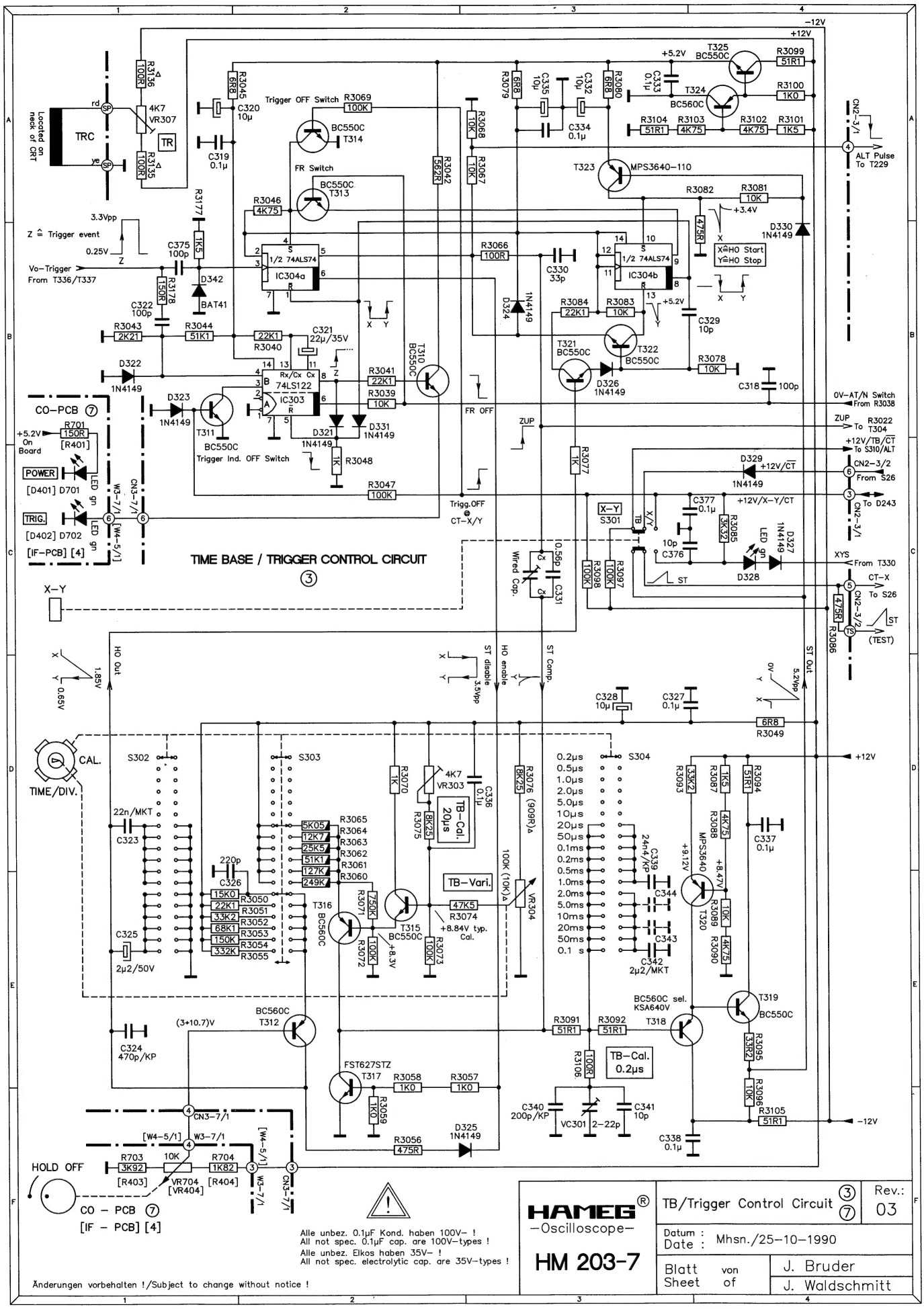
TIME BASE / TRIGGER CONTROL CIRCUIT
③
TRC
Located on neck of CRT
Z ≙ Trigger event
Vo-Trigger From T336/T337
Trigger OFF Switch
FR Switch
Trigger Ind. OFF Switch
CO-PCB ⑦
POWER
TRIG.
[IF-PCB] [4]
X-Y
CAL.
TIME/DIV.
HOLD OFF
CO - PCB ⑦
[IF - PCB] [4]
ALT Pulse To T229
0V-AT/N Switch From R3038
ZUP To R3022 T304
+12V/TB/CT To S310/ALT
CN2-3/2 From S26
To D243
XYS From T330
CT-X To S26
(TEST)
TB-Cal. 20µs
TB-Vari.
TB-Cal. 0.2µs
Alle unbez. 0.1µF Kond. haben 100V- !
All not spec. 0.1µF cap. are 100V-types !
Alle unbez. Elkos haben 35V- !
All not spec. electrolytic cap. are 35V-types !
Änderungen vorbehalten !/Subject to change without notice !
HAMEG®
-Oscilloscope-
HM 203-7
TB/Trigger Control Circuit ③ ⑦
Rev.: 03
Datum : Date : Mhsn./25-10-1990
Blatt Sheet von of
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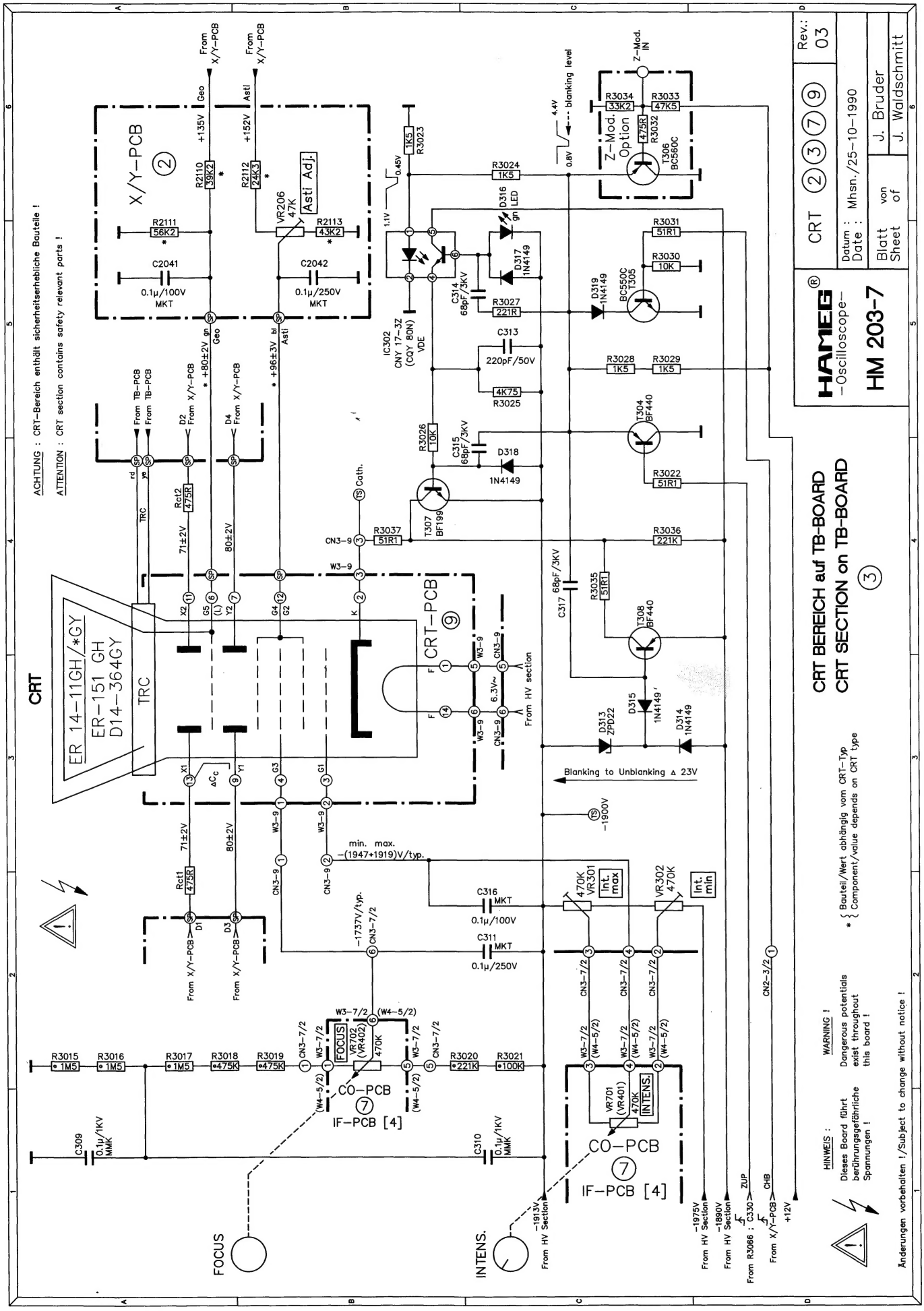
CRT
ER 14-11GH/*GY
ER-151 GH
D14-364GY
TRC
ACHTUNG : CRT-Bereich enthält sicherheitserhebliche Bauteile !
ATTENTION : CRT section contains safety relevant parts !
X/Y-PCB
Asti Adj.
Z-Mod. Option
CRT-PCB
CO-PCB
IF-PCB [4]
FOCUS
INTENS.
HAMEG
-Oscilloscope-
HM 203-7
CRT 2379
Rev.: 03
Datum : Mnsn./25-10-1990
Date :
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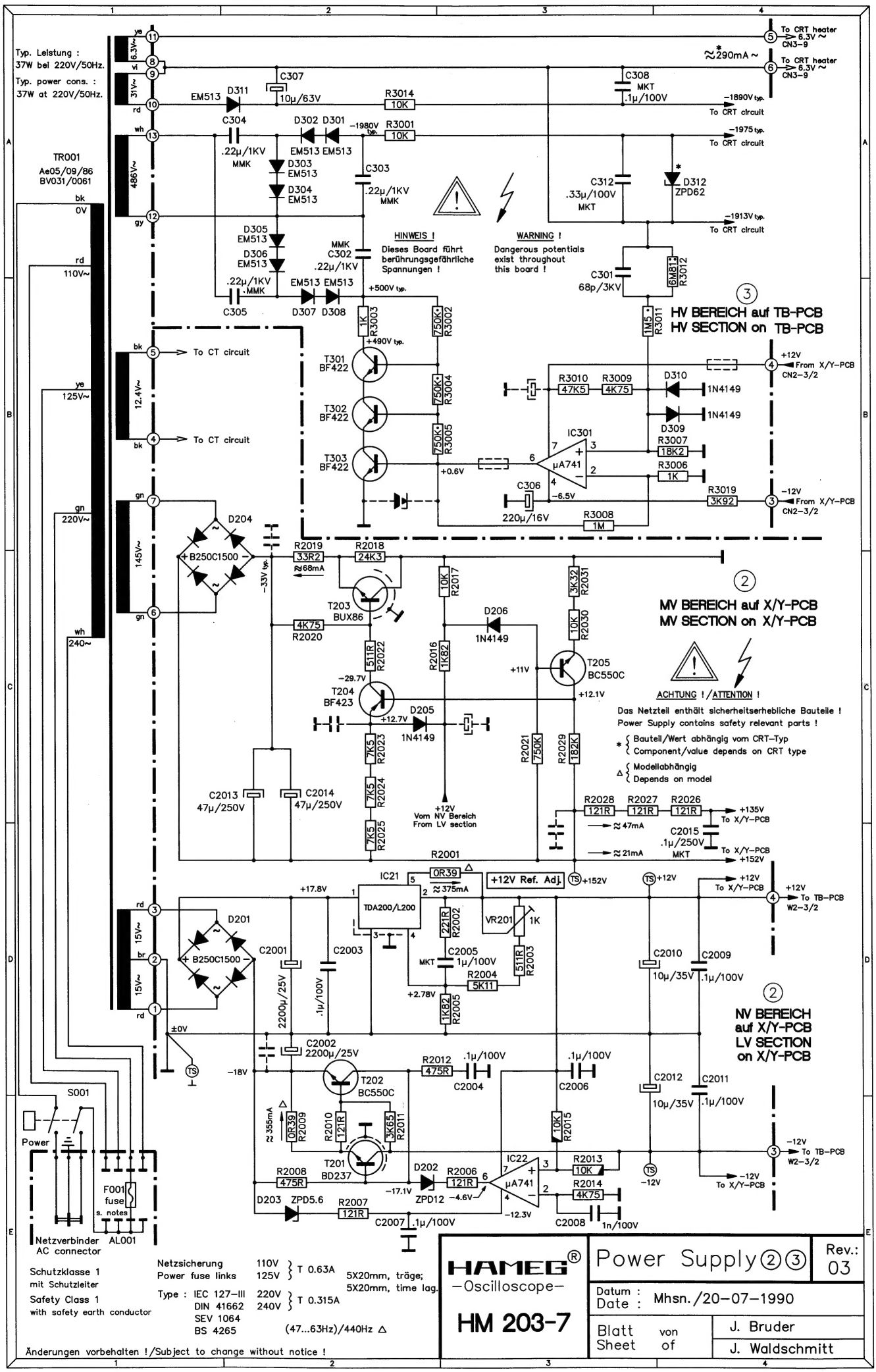
J. Bruder
J. Waldschmitt
CRT BEREICH auf TB-BOARD
CRT SECTION on TB-BOARD
3
HINWEIS : Dieses Board führt berührungsgefährliche Spannungen !
WARNING ! Dangerous potentials exist throughout this board !
Änderungen vorbehalten ! /Subject to change without notice !


Typ. Leistung : 37W bei 220V/50Hz.
Typ. power cons. : 37W at 220V/50Hz.
TR001
Ae05/09/86
BV031/0061
HINWEIS ! Dieses Board führt berührungsgefährliche Spannungen !
WARNING ! Dangerous potentials exist throughout this board !
HV BEREICH auf TB-PCB
HV SECTION on TB-PCB
MV BEREICH auf X/Y-PCB
MV SECTION on X/Y-PCB
ACHTUNG ! / ATTENTION !
Das Netzteil enthält sicherheitserhebliche Bauteile !
Power Supply contains safety relevant parts !
* Bauteil/Wert abhängig vom CRT-Typ / Component/value depends on CRT type
Δ Modellabhängig / Depends on model
NV BEREICH auf X/Y-PCB
LV SECTION on X/Y-PCB
+12V Ref. Adj.
S001
Power
F001 fuse
s. notes
Netzverbinder AL001
AC connector
Netzsicherung 110V / Power fuse links 125V } T 0.63A 5X20mm, träge; 5X20mm, time lag.
Type : IEC 127-III 220V / DIN 41662 240V / SEV 1064 / BS 4265 } T 0.315A
(47...63Hz)/440Hz Δ
Schutzklasse 1 mit Schutzleiter
Safety Class 1 with safety earth conductor
Änderungen vorbehalten ! / Subject to change without notice !
HAMEG® -Oscilloscope-
HM 203-7
Power Supply ② ③
Rev.: 03
Datum : Date : Mhsn./20-07-1990
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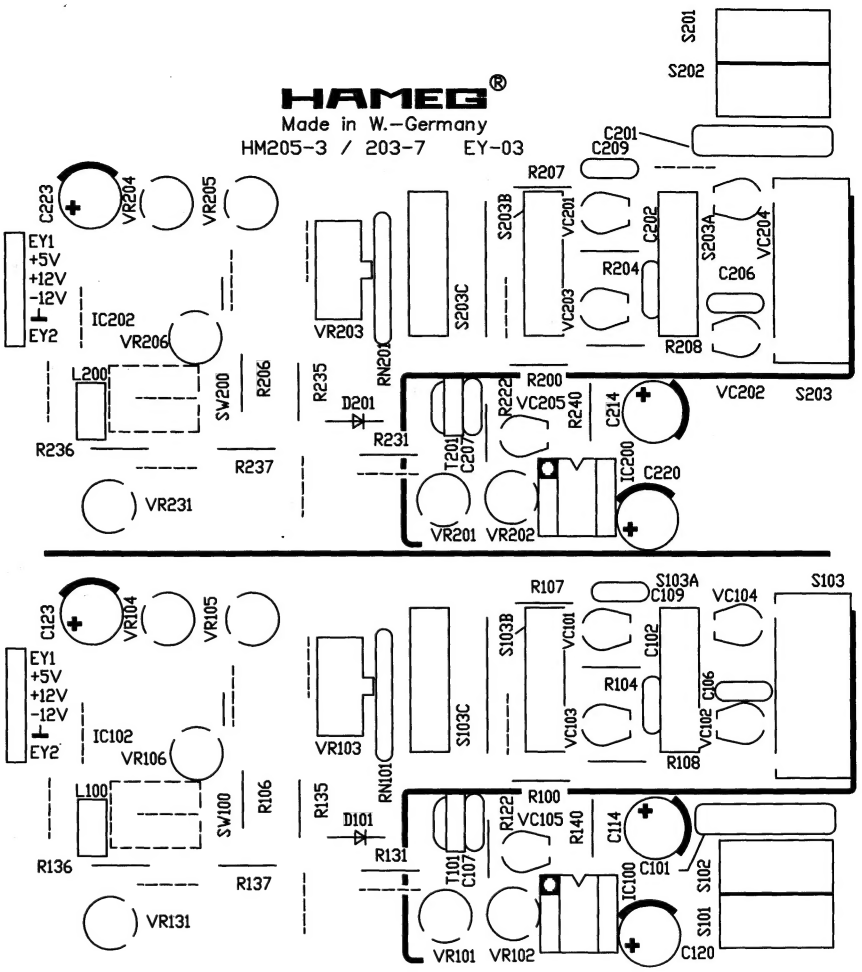
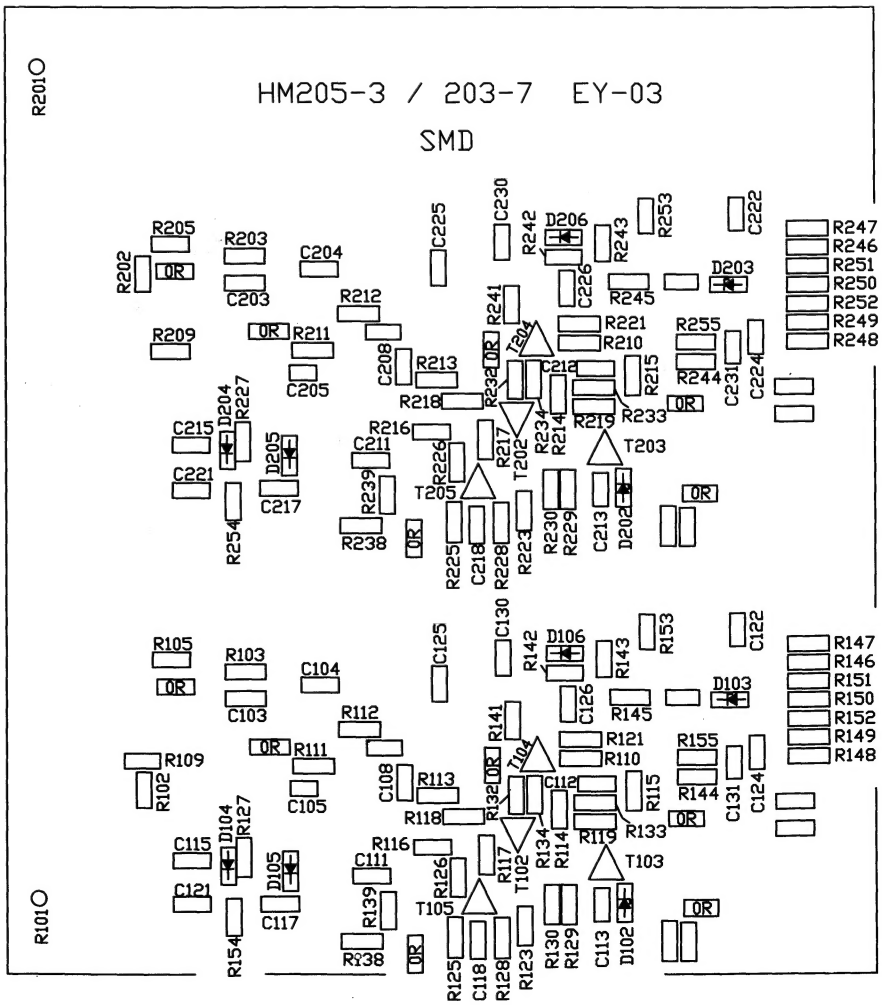
J. Bruder
J. Waldschmitt

Bestückungsplan EY-Board
Component Locations EY Board

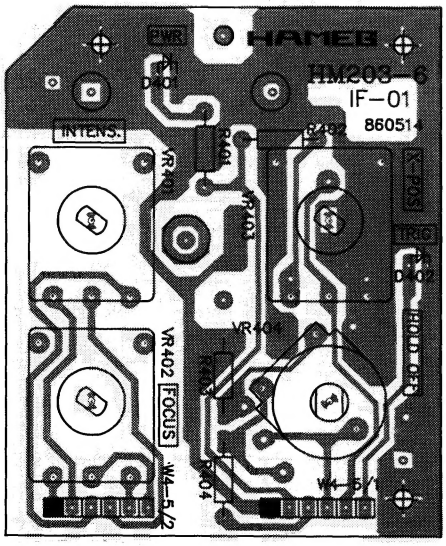
oben
top



unten
bottom



Bestückungsplan IF-Board
Component Locations IF Board



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